dens in snow located on land in the fall-early winter period (Harington 1968, p. 6; Lentfer and Hensel 1980, p. 102; Ramsay and Stirling 1990, p. 233; Amstrup and Gardner 1994, p. 5). The only known exceptions are in western and southern Hudson Bay, where polar bears first excavate earthen dens and later reposition into adjacent snow drifts (Jonkel et al. 1972, p. 146; Ramsay and Stirling 1990, p. 233), and in the southern Beaufort Sea, where a portion of the population dens in snow caves located on pack and shore-fast ice. Successful denning by polar bears requires accumulation of sufficient snow for den construction and maintenance. Adequate and timely snowfall combined with winds that cause snow accumulation leeward of topographic features create denning habitat (Harington 1968, p. 12).

A great amount of polar bear denning occurs in core areas (Harington 1968, pp. 7–8), which show high use over time (see Figure 8). In some portions of the species' range, polar bears den in a more diffuse pattern, with dens scattered over larger areas at lower density (Lentfer and Hensel 1980, p. 102; Stirling and Andriashek 1992, p. 363; Amstrup 1993, p. 247; Amstrup and Gardner 1994, p. 5; Messier et al. 1994, p. 425; Born 1995, p. 81; Ferguson et al. 2000a, p. 1125; Durner et al. 2001, p. 117; Durner et al. 2003, p. 57).

Habitat characteristics of denning areas vary substantially from the rugged mountains and fjordlands of the Svalbard archipelago and the large islands north of the Russian coast (Lønø 1970, p. 77; Uspenski and Kistchinski 1972, p. 182; Larsen 1985, pp. 321–322), to the relatively flat topography of areas such as the west coast of Hudson Bay (Ramsay and Andriashek 1986, p. 9; Ramsay and Stirling 1990, p. 233) and north slope of Alaska (Amstrup 1993, p. 247; Amstrup and Gardner 1994, p. 7; Durner et al. 2001, p. 119; Durner et al. 2003, p. 61), to offshore pack ice-pressure ridge habitat (Amstrup and Gardner 1994, p. 4; Fischbach et al. 2007, p. 1,400). The key characteristic of all denning habitat is topographic features that catch snow in the autumn and early winter (Durner et al. 2003, p. 61). Across the range, most polar bear dens occur relatively near the coast. The main exception to coastal denning occurs in the western Hudson Bay area, where bears den farther inland in traditional denning areas (Kolenosky and Prevett 1983, pp. 243–244; Stirling and Ramsay 1986, p. 349).

Current Population Status and Trend

The total number of polar bears worldwide is estimated to be 20,000–25,000 (Aars et al. 2006, p. 33). Polar bears are not evenly distributed throughout the Arctic, nor do they comprise a single nomadic cosmopolitan population, but rather occur in 19 relatively discrete populations (Aars et al. 2006, p. 33). The use of the term ''relatively discrete population'' in this context is not intended to equate to the Act's term ''distinct population segments'' (Figure 1). Boundaries of the 19 polar bear populations have evolved over time and are based on intensive study of movement patterns, tag returns from harvested animals, and, to a lesser degree, genetic analysis (Aars et al. 2006, pp. 33–47). The scientific studies regarding population bounds began in the early 1970s and continue today. Within this final rule we have adopted the use of the term ''population'' to describe polar bear management units consistent with their designation by the World Conservation Union-International Union for Conservation of Nature and Natural Resources (IUCN), Species Survival Commission (SSC) Polar Bear Specialist Group (PBSG) with information available as of October 2006 (Aars et al. 2006, p. 33), and to describe a combination of two or more of these populations into ''ecoregions,'' as discussed in following sections. Although movements of individual polar bears overlap extensively, telemetry studies demonstrate spatial segregation among groups or stocks of polar bears in different regions of their circumpolar range (Schweinsburg and Lee 1982, p. 509; Amstrup et al. 1986, p. 252; Amstrup et al., 2000b, pp. 957–958.; Garner et al. 1990, p. 224; Garner et al. 1994, pp.112–115; Amstrup and Gardner 1994, p. 7; Ferguson et al. 1999, pp. 313–314; Lunn et al. 2002, p. 41). These patterns, along with information obtained from survey and reconnaissance, marking and tagging studies, and traditional knowledge, have resulted in recognition of 19 relatively discrete polar bear populations (Aars et al. 2006, p. 33). Genetic analysis reinforces the boundaries between some designated populations (Paetkau et al. 1999, p. 1,571; Amstrup 2003, p. 590) while confirming the existence of overlap and mixing among others (Paetkau et al. 1999, p. 1,571; Cronin et al. 2006, p. 655). There is considerable overlap in areas occupied by members of these groups (Amstrup et al. 2004, p. 676; Amstrup et al. 2005, p. 252), and boundaries separating the groups are adjusted as new data are collected. These boundaries, however, are thought to be ecologically meaningful, and the 19 units they describe are managed as populations, with the exception of the Arctic Basin population where few bears are believed to be year-round residents.